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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/087,302	02/28/2002	Morten Eriksen	43708.14	3786

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EXAMINER	
NATNITHITHADHA, NAVIN	

ART UNIT	PAPER NUMBER
3736	7

DATE MAILED: 06/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/087,302	ERIKSEN ET AL.	
	Examiner	Art Unit	
	Navin Natnithithadha	3736	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 April 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29 and 31-36* is/are rejected.

7)☒ Claim(s) *30* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 February 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 6.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. Claims 4-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 4 recites the limitation "the current generating means" in line 1. There is insufficient antecedent basis for this limitation in the claim. How does the "current generating means" relate to the device of claim 1? A basis for "current generating means" needs to be defined and how it relates to the device would also have to be stated.

Claim 5 recites the limitation "the conductive coil means comprises a plurality of coil loops which are configured tightly about the thoracic region and the abdominal region of the mammal" in line 1. There is insufficient antecedent basis for this limitation in the claim. Neither "the conductive coil means" nor "the mammal" were defined in claim 1. The claim needs to show that the "conductive coil means" is a further limitation of the "electrical circuits" and that the "mammal" is a further limitation of the "object".

Claim 6 recites the limitation "the conductive coil means, the fixed coil means, and the current generating means" in line 3. There is insufficient antecedent basis for this limitation in the claim. The "conductive coil means", "the fixed coil means", and the "current generating means" are not defined in claim 1. A basis for these elements needs to be defined and how it relates to the device would also have to be stated.

Claims 7, line 3, and claim 8, line 3 recite the limitation "the mammal". There is insufficient antecedent basis for this limitation in the claim. A "mammal" was not defined in claims 1 and 6. The claims need to show that the "mammal" is a further limitation of the "object".

Claim 9 recites the limitations "the current generating means", "the conductive coil means", and "the mammal" in lines 1-4. There is insufficient antecedent basis for these limitations in the claim. The elements were not defined in claim 1.

Claim 10 recites the limitations "the current generating means", "the coil means", and "the generated current" in lines 1-3. There is insufficient antecedent basis for these limitations in the claim. These elements were not defined in claim 1.

Claim 11 recites the limitations "the sensing and control means", "the coil means" and "the other coil means" in lines 1-3. There is insufficient antecedent basis for these limitations in the claim. These elements were not defined in claim 1.

Claim 12 recites the limitations "the conductive coil means" and "the coil means" in lines 1 and 3. There is insufficient antecedent basis for these limitations in the claim. The elements were not defined in claims 1 or 2.

Claim 13 recites the limitations "the fixed coil means" and "the conductive coil means" in lines 1, 2, 4, and 5 of claim 13. There is insufficient antecedent basis for these limitations in the claim. The elements were not defined in claim 1.

Claim 14 is dependent on claim 13.

Claim 15 recites the limitation "the portion of the mammal" in line 3. There is insufficient antecedent basis for this limitation in the claim. The element was not defined in claims 1 or 15.

Claim 16 recites the limitations "the conductive coil means", "the coil loops", and the mammal in lines 1 and 3-6. There is insufficient antecedent basis for this limitation in the claim. The element was not defined in claim 1.

Claim 17 recites the limitation "the conductive coil means" and "the mammal" in lines 1, 3, 5, and 6. There is insufficient antecedent basis for this limitation in the claim. The element was not defined in claim 1.

Claim 18 recites the limitation "the portion of the mammal" in line 2. There is insufficient antecedent basis for this limitation in the claim. The element was not defined in claim 1.

It appears the added claims 4-18 do not match the subject matter being claimed in claims 1-3. These claims should either be amended or substantially amended. In examining claims 4-18, the Examiner has interpreted the following elements as connected to the corresponding broad elements of claim 1:

a) "the current generating means" = "means for creating time-varying magnetic fields...";

b) "the conductive coil means" and "the fixed coil means" = "electrical circuits"; and

c) "the mammal" = "the human body".

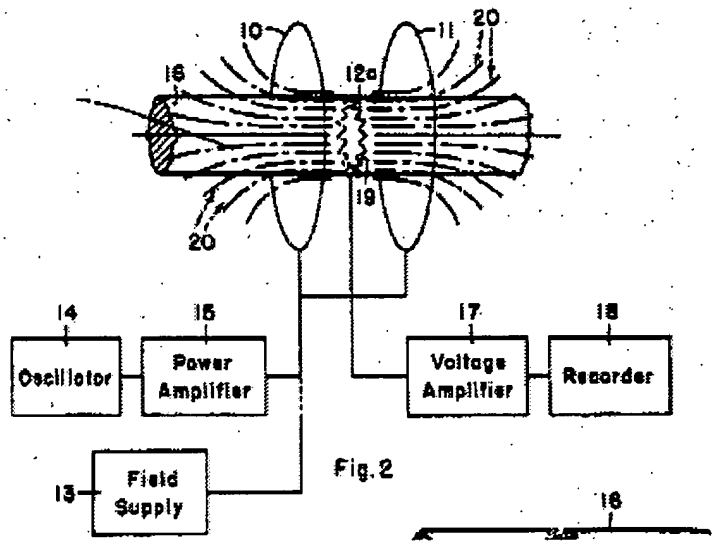
Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

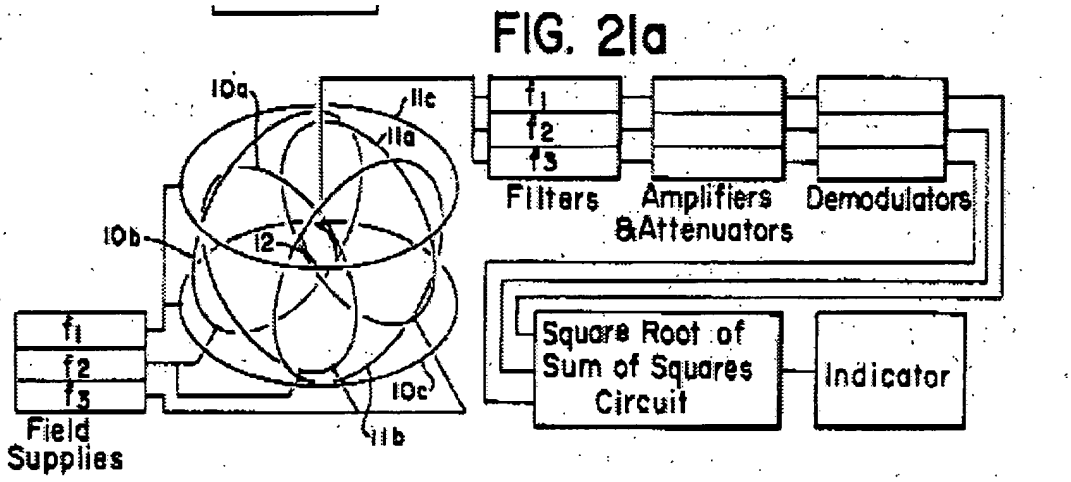
> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-11, 13-15, and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Goldberg et al, US 3,731,184 A.

Claim 1: Goldberg et al disclose a device for measuring the movement ("displacements" or "changes in cross-sectional areas") of an object (see col. 1, lines 6-10 and lines 45-50 and see fig. 2 below) comprising: means 13 for creating time-varying magnetic fields at least large enough to surround the object (see col. 6, lines 55-62); electrical circuits 10 and 11 adapted to conform ("embracing" or "contacting engagement") to the surface of the object (see col. 6, lines 47-52); and voltage monitoring means 18 connected to the electrical circuits, whereby motion of the surface creates a measurable change in induced voltage in the circuits that correlates to the movement of the object (see col. 6, lines 27-45).



Claim 2: Goldberg et al disclose a computing means (square root of sum of squares circuit, see fig. 21a) suitable for performing a series of algorithmic steps to calculate the volume change of the object from the measured induced voltage (see col. 16, lines 22-39).



Claim 3: Goldberg et al disclose the electrical circuits (Goldberg's "invention") are adapted to conform to one or more portions of a human body (see col. 2, lines 30-39).

Claim 5: Goldberg et al disclose coils 10 and 11 (see fig. 2), which are capable of configuring to the thoracic region and the abdominal region of a human body (see col. 2, lines 30-39).

Claim 6: Goldberg et al disclose sensing and control means (control circuit 62) for controlling operation of the device, the sensing and control means being electrically connected to the conductive coil means 10, the fixed coil means 11, and the current generating means 13 (see fig. 20d below).

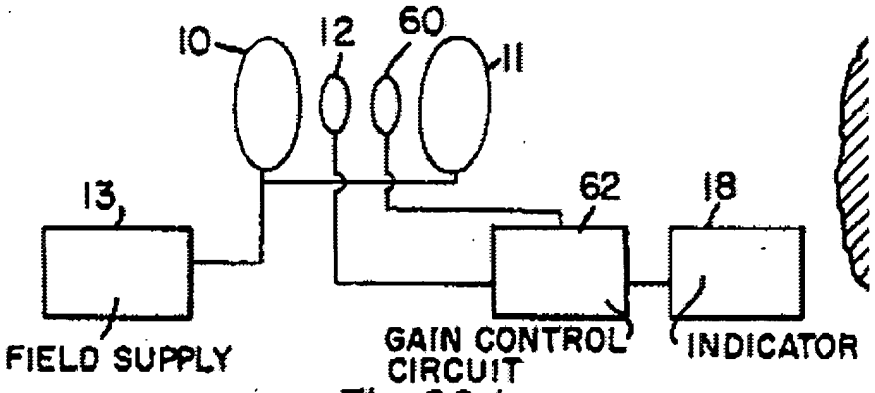


Fig. 20d

Claims 7 and 8: Goldberg et al disclose sensing and control means (gain control circuit 62) (see fig. 20d).

Claim 9: Goldberg et al disclose the current generating means (field supply 13), comprises a constant current circuit to maintain the current in the conductive coil means 10 (see fig. 2).

Claim 10: Goldberg et al disclose the current generating means (field supply 13) comprises a signal generator and a constant current amplifier electrically connected to the coil means which is receiving the generated current (see fig. 2).

Claim 11: Goldberg et al disclose the sensing and control means (control circuit 62) (see fig. 20d).

Claims 13-15: Goldberg et al disclose the fixed coil means 10 comprises a plurality of small coil elements 10a, 10b, 10c (see fig. 21a).

Claim 18: Goldberg et al disclose the computational means (indicator 18) for receiving a signal representative of sensed volume of the portion of the mammal and for converting the signal to true volume values (see fig. 20d).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 4, 19-29, 31-33, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goldberg et al, US 3,731,184 A.

Claim 4: Goldberg et al disclose passing current to the field coils 10 and 11 and to the pick-up coil 12. Goldberg et al does not disclose generating current with a frequency range of about 10kHz to about 200 kHz and from about 1 milliampere to about 1 ampere. However, Goldberg et al's invention is capable of passing current of a frequency range of about 10kHz to about 200 kHz and from about 1 milliampere to about 1 ampere. It would have been obvious to one of ordinary skill in the art to modify

the current to the field coils of Goldberg et al's invention because Goldberg et al's invention in order to accurately measure a range of motion.

Claim 19: Goldberg et al disclose a device for measuring the changing area within at least one portion of a mammal due to cardiac function (see col. 1, lines 6-11, lines 45-50, and col. 2, liens 35-39), comprising: conductive coil means 10 or 11 capable of being configured tightly about the various circumferences of at least one portion of the mammal (see fig. 2); fixed coil means 12 capable of remotely located relative to the conductive coil means about the mammal; and, current generating means capable of selectively providing alternating current to either one of the conductive coil means or the fixed coil means to create an induced voltage in the other coil means representative of true area within the coil means that is configured tightly about the various circumferences of the mammal portion or portions, with the signals and area changing over time due to the cardiac function of the mammal. It would be obvious to one of ordinary skill in the art to modify the Goldberg et al device to be capable of having the structure as claimed in order to effectively adapt the device to measure plethysmography on the human body as suggested by Goldberg et al in column 2, lines 35-39.

Claim 20: Goldberg et al disclose the conductive coil means comprises electrically conductive coil loops that are capable of being equally spaced on a flexible substrate that is suitable of wearing by the mammal.

Claim 21: Goldberg et al disclose the conductive coil means comprises electrically conductive loops that are closed circumferential loops (see fig. 2).

Claim 22: Goldberg et al disclose the current generating means 13. The current generating means 13 is capable of a frequency range of about 10kHz to about 200 kHz and from about 1 milliampere to about 1 ampere.

Claim 23: Goldberg et al disclose the conductive coil means comprises a plurality of coil loops (see fig. 21a).

Claims 24 and 25: Goldberg et al disclose sensing and control means (gain control circuit 62 or regulating circuit) of controlling operation of the device (see fig. 20d and 20e).

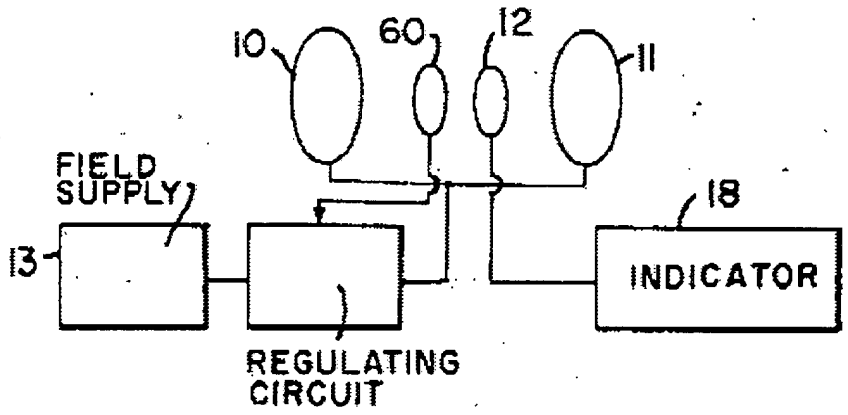


Fig 20e

Claims 26: Goldberg et al disclose sensing and control means (gain control circuit 62) (see fig. 20d).

Claim 27: Goldberg et al disclose the current generating means (field supply 13), comprises a constant current circuit to maintain the current in the conductive coil means 10 (see fig. 2).

Claim 28: Goldberg et al disclose the current generating means (field supply 13) comprises a signal generator and a constant current amplifier electrically connected to the coil means which is receiving the generated current (see fig. 2).

Claim 29: Goldberg et al disclose the sensing and control means (control circuit 62) (see fig. 20d).

Claims 31-33: Goldberg et al disclose the fixed coil means 10 comprises a plurality of small coil elements 10a, 10b, 10c (see fig. 21a).

Claim 36: Goldberg et al disclose the computational means (indicator 18) for receiving a signal representative of sensed area of the portion of the mammal and for converting the signal to true area values (see fig. 20d).

4. Claims 16, 17, 34, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goldberg et al, US 3,731,184 A in view of Sackner et al, US 5,159,935 A.

Goldberg et al disclose claims 1 and 19 as discussed above.

Claims 16 and 17: Goldberg et al does not disclose the conductive coil means comprises conductive coil loops that are equally spaced, or spaced at constant and known intervals, and carried by an elastic and conformable substrate that is suitable for wearing by the mammal in a manner similar to a tightly fitting garment which is configured so that the coil loops always conform to the same surface of the portion of the mammal regardless of any shape change which that portion of the mammal may experience during respiration. However, Sackner et al disclose the conductive coil

means as claimed by the limitations of claims 16 and 17 (see fig. 1A and col. 8, lines 36-59). It would have been obvious for one of ordinary skill in the art at the time the invention was made to modify Goldberg et al's invention to have the conductive coil loops as claimed in claims 16 and 17 in order to efficiently measure plethysmography on the human body as suggested by Goldberg et al in column 2, lines 35-39.

Allowable Subject Matter

6. Claims 12 and 30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. Claim 12 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter:

Claim 12: The prior art does not disclose conductive coil means are electrically connected in series so that the instantaneous volume V may be calculated from the voltage reading U of the volume output signal in the coil means which is receiving the induced voltage by use of the formula $V= U * d * k_c$.

Claim 30: The prior art does not disclose conductive coil means are electrically connected in series so that the area A may be calculated from the voltage reading U of a single coil loop which is receiving the induced voltage by use of the formula $A= U * k$.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Navin Natnithithadha whose telephone number is (703) 305-2445. The examiner can normally be reached on Monday-Friday, 8:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mary Beth Jones can be reached on (703) 308-3400. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Robert L Nasser Jr
ROBERT L. NASSER
PRIMARY EXAMINER

Navin Natnithithadha
Patent Examiner
GAU 3736
May 13, 2004